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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/701,046	11/03/2003	Glen Roeters	30-4900 DIV - 4010	5506

7590 12/10/2004  
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EXAMINER

NGUYEN, THANH T

ART UNIT	PAPER NUMBER
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2813

DATE MAILED: 12/10/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

10/701,046

**Applicant(s)**

ROETERS ET AL.

K

**Examiner**

Thanh T. Nguyen

**Art Unit**

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 21-33 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 21-33 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

## **DETAILED ACTION**

### ***Oath/Declaration***

Oath/Declaration filed on 4/15/04 has been considered.

### ***Specification***

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

### ***Claim Objections***

Claim 24 is objected to because of the following informalities: there seems to be missing an open parentheses before "morpholino". Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 22 recites the limitation "the rinsing solution" in line 3. There is insufficient antecedent basis for this limitation in the claim. It is suggested to change to "the low-species buffer solution".

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 21, 23, 25, 27-32 are rejected under 35 U.S.C. 102(b) as being anticipated by Vinci et al. (U.S. Patent No. 5,296,041).

Referring to, teaches an intermediate comprising:

An electronic substrate (see col. 3, lines 14-15) having residues from an etching step (see col. 8, lines 29-46); and

A low-species buffer solution consisting essentially of deionized water and buffer () contacting the printed circuit board in a bath (see col. 13, lines 1-15), wherein the buffer is present in the solution at a concentration effective to dissolve or displace a residue on the electronic substrate, and at a concentration effective to eliminate deposition of residues on the printed circuit board (col. 13, lines 52-60).

Regarding to claim 22, the buffer consists essentially of sodium bicarbonate, potassium bicarbonate or a combination thereof (see col. 9, lines 5-13).

Regarding to claim 23, the buffer comprises an amphoteric buffer (see col. 6, lines 53-67).

Regarding to claim 25, residue comprises an etchant (see col. 8, lines 29-45).

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Regarding to claim 27, residue comprises a particulate material (solder flux, waxes, etc., see abstract).

Regarding to claim 28, electronic substrate comprises an electronic interconnect structure (see col. 8, lines 29-45).

Regarding to claim 29, the electronic substrate comprises an integrated circuit (see col. 7, lines 23-26).

Regarding to claim 30, the electronic substrate comprises a printed circuit board (see abstract).

Regarding to claim 31-32, the pH of the low species buffered fluid (col. 3, lines 14-40).

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 22, 24, 26, 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vinci et al. (U.S. Patent No. 5,296,041) as applied to claims 21, 23, 25, 27-32 in view of Takeda et al. (U.S. Patent No. 5,464,516), and further in view of Ilardi et al. (U.S. Patent No. 5,466,389).

However, the reference does not specifically teaches the amphoteric buffer comprises Tris-(hydroxymethyl) aminomethane, N-2-Hydroxyethylpiperazine-N'-2-ethanesulfonic acid, or N-(morpholino)-ethanesulfonic acid (in claim 24), the residue comprises copper (in claim 26),

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and the concentration of the buffer (in claims 22, 33), the pH of the low species buffered fluid (in claims 31-32).

Takeda et al. teaches the amphoteric buffer comprises Tris-(hydroxymethyl) aminomethane (see col. 4, lines 10-17).

Therefore, it would have been obvious to a person of ordinary skill in the requisite art at the time of the invention was made would use Tris-(hydroxymethyl) aminomethane as a buffer in process of Vinci et al. as taught by Takeda et al. because the buffer is known in the art for removing the contaminant on the surface of the integrated circuit.

Ilardi et al. teaches the residue comprises copper (see col. 10, lines 59-67, col. 11, lines 1-7).

Therefore, it would have been obvious to a person of ordinary skill in the requisite art at the time of the invention was made would form a copper residue in process of Vinci et al. as taught by Sakamoto because copper is unstable and decomposes in rapid exothermic fashion leading to potentially dangerous conditions, therefore it need to remove to form a stable and clean integrated circuit substrate.

The specific concentration range and the range of pH level of the buffer are considered to involve routine optimization while has been held to be within the level of ordinary skill in the art. As noted in In re Aller, the selection of reaction parameters such as temperature and concentration would have been obvious:

"Normally, it is to be expected that a change in temperature, or in concentration, or in both, would be an unpatentable modification. Under some circumstances, however, changes such as these may impart patentability to a process if the particular ranges claimed produce a new and unexpected result which is different in kind and not merely degree from the results of the prior art...such ranges are termed "critical ranges and the applicant has the burden of proving such criticality.... More particularly, where the

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general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation."

*In re Aller* 105 USPQ 233, 255 (CCPA 1955). See also *In re Waite* 77 USPQ 586 (CCPA 1948); *In re Scherl* 70 USPQ 204 (CCPA 1946); *In re Irmscher* 66 USPQ 314 (CCPA 1945); *In re Norman* 66 USPQ 308 (CCPA 1945); *In re Swenson* 56 USPQ 372 (CCPA 1942); *In re Sola* 25 USPQ 433 (CCPA 1935); *In re Dreyfus* 24 USPQ 52 (CCPA 1934).

Therefore, one of ordinary skill in the requisite art at the time the invention was made would have used any concentration range and the range of pH level of the buffer suitable to the method in process of Vinci et al. in order to optimize the process.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thanh Nguyen whose telephone number is (571) 272-1695, or by Email via address Thanh.Nguyen@uspto.gov. The examiner can normally be reached on Monday-Thursday from 6:00AM to 3:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead, Jr., can be reached on (571) 272-1702. The fax phone number for this Group is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0956 (See MPEP 203.08).



Thanh Nguyen